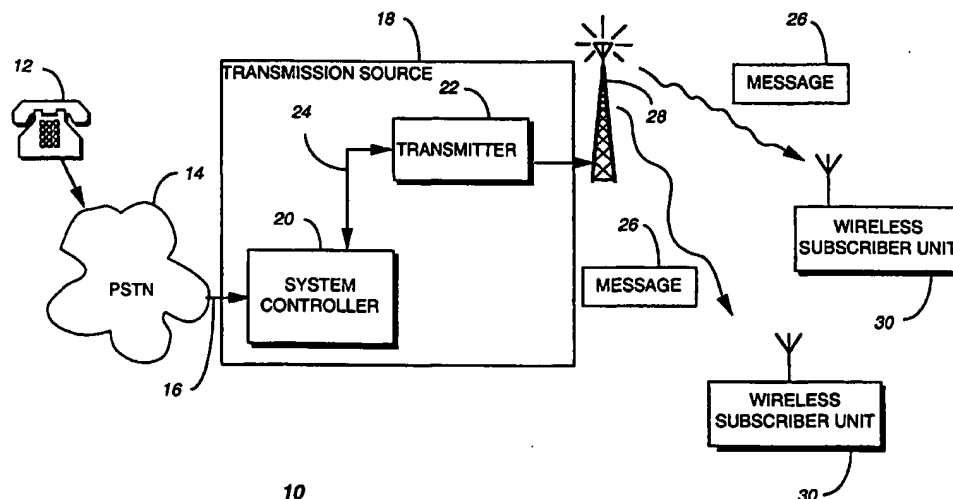




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US99/22714 <b>(22) International Filing Date:</b> 30 September 1999 (30.09.99) <b>(30) Priority Data:</b> 09/191,408 12 November 1998 (12.11.98) US <b>(71) Applicant:</b> MOTOROLA, INC. [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US). <b>(72) Inventors:</b> HYMEL, James, Allen; 7738 Blairwood Circle East, Lake Worth, FL 33467 (US). INDEKEU, Jack, P.; 7594 Windmere Court, Lake Worth, FL 33467 (US). <b>(74) Agents:</b> NICHOLS, Daniel, K. et al.; Motorola Inc., Intellectual Property Dept., 1500 Gateway Boulevard, Boynton Beach, FL 33426-8292 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** WIRELESS SUBSCRIBER UNIT AND METHOD FOR PRESENTING ADVERTISEMENTS AS A MESSAGE INDICATOR

**(57) Abstract**

A wireless subscriber unit (30) contains an advertisement manager (56). The advertisement manager (56) is programmed to assign an advertisement icon (54) to a message indicator (46) on the display (42) of the wireless subscriber unit (30). Assignment of the advertisement icon (54) to the message indicator (46) associated with a message (26) may be based on a predetermined algorithm in the advertisement manager (56), or based on a notification received from the wireless communication system (10).

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## WIRELESS SUBSCRIBER UNIT AND METHOD FOR PRESENTING ADVERTISEMENTS AS A MESSAGE INDICATOR

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### Field of the Invention

This invention relates in general to wireless communication systems, and particularly, to wireless subscriber units having message indicators.

10

### Background of the Invention

Historically, wireless subscriber units, such as cellular telephones and pagers, have had the ability to receive a message sent from a wireless communication system, and perform standard functions in response to message receipt such as storing the message, displaying the message, or alerting the user of receipt of the message. The messages are typically a numeric message such as a phone number, or an alphanumeric message containing one unique piece of information such as "meeting in my office at 6:00pm."

The user is alerted of receipt of a new message by an audible alert or a vibratory alert. The display of many wireless subscriber units today includes a message indicator for each message it has received and stored in memory. This message indicator allows a quick view for the user of how many messages are in the wireless subscriber unit and also allows the user to quickly pick a message to view. The message indicator is typically a simple graphical object such as a triangle or an arrow.

Today, wireless service providers are teaming up with advertisers to provide advertisements on wireless subscriber units. The advertisers benefit from such partnerships by being able to send advertising messages to a large number of potential consumers in a cost effective manner. Advertisements can be sent as an individual alphanumeric message, or as an attachment to another alphanumeric message such as a free information service message.

One drawback to sending advertisements as an individual message or an attachment to the free information service message is that the user can delete the message without ever reading it. Alternatively, the user can begin to read the message, see that it is an advertisement, and delete it.

5 Another drawback to sending alphanumeric advertisement messages is the annoyance factor of the wireless subscriber user. The disturbance created for the end user can negate any positive benefits to the advertiser.

Hence, what is needed is a non-intrusive method for advertising to the end user of wireless subscriber units that provides for multiple viewing hits of  
10 the same advertisement.

### **Brief Description of the Drawings**

FIG. 1 is an electrical block diagram of a wireless communication  
15 system;

FIG. 2 is an electrical block diagram of a wireless subscriber unit that operates within the wireless communication system of FIG. 1 in accordance with the invention;

20

FIG. 3 is a flow chart illustrating the operation of the wireless subscriber unit of FIG. 2; and

FIG. 4 is a flow chart illustrating more detail of the operation of the  
25 wireless subscriber unit of FIG. 2.

### **Description of the Preferred Embodiment**

Referring to FIG. 1, an electrical block diagram of a wireless  
30 communication system 10 is shown. The wireless communication system 10 comprises a message input device, such as a telephone 12 connected through a conventional switched telephone network (PSTN) 14 by conventional telephone links 16 to a transmission source 18.

The transmission source 18 includes a system controller 20 and at least  
35 one system transmitter 22. The system controller 20 oversees the operation of the system transmitter 22 through one or more communication links 24, which typically are twisted pair telephone wires, and additionally can include

RF, microwave, or other high quality audio communication links. The system controller **20** encodes and decodes inbound and outbound telephone addresses into formats that are compatible with landline message switch computers. The system controller **20** also functions to digitally encode and  
5 schedule outbound messages such as a message **26**, for transmission by the system transmitter **22** via the system transmit antenna **28** to a plurality of wireless subscriber units **30**, on at least one outbound radio frequency (RF) channel.

It will be appreciated that the wireless communication system **10** may  
10 function utilizing any wireless RF channel, for example, a one or two way pager channel, a mobile cellular channel, or a mobile radio channel. In the following description, the wireless communication system **10** refers to any of the wireless communication systems listed above or an equivalent. Each wireless subscriber unit **30** assigned for use in the wireless communication  
15 system **10** has an address assigned thereto which is a unique selective call address in the wireless communication system **10**. The address enables the transmission of a message **26** from the system controller **20** only to the addressed wireless subscriber unit **30**, and identifies the messages and responses received at the system controller **20** from the wireless subscriber  
20 unit **30**. A list of the assigned addresses for each of the wireless subscriber units **30** is stored in the system controller **20** in the form of a subscriber database.

FIG. **2** is an electrical block diagram of the wireless subscriber unit **30** that operates within the wireless communication system **10** of FIG. **1**. The  
25 wireless subscriber unit **30** comprises an antenna **32** for intercepting RF signals from the wireless communication system **10**. The antenna **32** is coupled to a receiver **34** employing conventional demodulation techniques for receiving the communication signals transmitted by the wireless communication system **10** such as the message **26**. Radio frequency  
30 signals received by the receiver **34** produce demodulated information, which is coupled to a message processor **36** for processing received messages.

To perform the necessary functions of the wireless subscriber unit **30**, the message processor **36** is coupled to a memory **38** including a random access memory (RAM), a read-only memory (ROM), and an electrically  
35 erasable programmable read-only memory (EEPROM). Preferably, the message processor **36** is similar to the MC68328 micro-controller manufactured by Motorola, Inc. It will be appreciated that other similar

processors can be utilized for the message processor 36, and that additional processors of the same or alternative type can be added as required to handle the processing requirements of the message processor 36.

5 The message processor 36 decodes an address in the demodulated data of the received message 26, compares the decoded address with one or more addresses stored in the memory 38, and when a match is detected, proceeds to process the remaining portion of the message 26. Once the message processor 36 has processed the message 26, it stores the message 26 in the memory 38. The message processor 36 also sends a  
10 command to the alert 40 to notify the user that a message has been received. This alert may be an audio alert (e.g. speaker or transducer) or a tactile alert (e.g. vibrator). It will be appreciated that other alerting mechanisms are also possible.

The display 42 includes a plurality of message indicators 44. When the  
15 display 42 receives a command from the message processor 36 that a new message 26 has been received and stored in memory 38, a message indicator 46 is activated. Selection by the end user via the user input 48 of the message indicator 46 associated with the message 26 will display the message 26 on the screen. To take advantage of the present invention, the  
20 display 42 is preferably a high resolution graphics liquid crystal display. It will be appreciated that other similar displays can be utilized for the display 42.

In a preferred embodiment, the wireless subscriber unit 30 includes an advertisement memory 50 that stores a plurality of advertisement icons 52. Each advertisement icon 54 comprises a thumbnail graphical depiction, or a  
25 reduced size graphical depiction, of a particular advertiser's symbolism. For example, the advertisement icon associated with Motorola may be the Motorola batwing symbol. The advertisement memory preferably is an electrically erasable programmable read-only memory (EEPROM), however, any alternative memory may be used. The advertisement icons 52 may be  
30 programmed into the advertisement memory 50 via a memory programmer unit at the service provider, via over the air programming methods from the service provider, or any other equivalent manner.

Storing the advertisement icon in memory for later use increases the throughput and efficiency of the service provider's network over conventional  
35 methods of sending the advertisement message along with a personal or information service message. The advertisement icons can be programmed off of the channel or during low traffic periods of time, thus allowing an

efficient and cost effective method to both the advertiser and the service provider.

The wireless subscriber unit **30** preferably also includes an advertisement manager **56**. Preferably, the advertisement manager **56** is  
5 similar to the MC68328 micro-controller manufactured by Motorola, Inc. It will be appreciated that additional processors of the same or alternative type can be added as required to handle the processing requirements of the advertisement manager **56**.

The advertisement manager **56** is programmed to assign advertisement  
10 icons **52** to the message indicators **44** on the display **42**. The assignment of the advertisement icon **54** to the message indicator **46** associated with the message **26** may be based on a message number, a message keyword, a message type, a message topic, or any other message characteristic defined by the service provider, the end user, or the advertiser.

15 Using advertisement icons as message indicators increases the advertisers' ability for subconscious repetition of an advertisement to end users of the wireless subscriber unit (**30**). Easy to implement facilitation of a method for increased brand recognition provides an incentive to the advertisers to subsidize the wireless service, lowering the overall cost of the  
20 service to the end user, increasing the value of the service, aiding in the growth of the wireless industry.

In one embodiment, the message **26** includes a message identification number **58**, the advertisement icon **54** includes an advertisement  
25 identification number **60**, and the advertisement manager **56** assigns the advertisement icon **54** to the message indicator **46** by matching those identification numbers.

Alternatively, the message **26** includes a time duration **62** and the advertisement icon **54** is assigned to the message indicator **46** based on the time duration **62**.

30 The advertisement icons **52** in the advertisement memory **50**, may be updated by the service provider sending update messages to the wireless subscriber unit **30**, the message processor **36**, upon receipt of an update message, will send a command to the advertisement manager **56** with the new advertisement icon data. The advertisement manager **56** then stores  
35 this new advertisement icon **54** into the advertisement memory **50** for later use.

FIG. 3 is a flow chart illustrating how the wireless subscriber unit 30 operates in accordance with the invention. The wireless subscriber unit 30 remains in a stand-by mode awaiting receipt of the message, in step 64. When a message 26 is received, the message is processed in step 66.

- 5 Processing includes matching the message address to the address stored in the wireless subscriber unit 30, and alerting the user if the message address matches using the alert 40, as described earlier. The message 26 is also stored in memory 38, step 68. After storing the message 26 in memory, the message indicator 46 is activated on the display 42. Prior to activating the
- 10 message indicator, 46, the advertisement manager 56 assigns the advertisement icon 54 to be used as the message indicator 46, in step 70, for the received message 26. Next, in step 72, the advertisement icon 54 is displayed as the message indicator 46 for the received message 26 on the display 42. The process then cycles back to the beginning and the wireless
- 15 subscriber unit 30 continues checking for receipt of another message.

- FIG. 4 is a flow chart illustrating more detail of how the advertisement manager 56 is programmed to assign the advertisement icon 54 to the message indicator 46 for the message 26. In step 74, a variable N is set to the number one for tracking and explanation purposes. In step 76, the
- 20 advertisement manager 56 assigns the Nth advertisement icon as the message indicator 46 for the received message 26. The wireless subscriber unit 30 continues to check for receipt of a message in step 78. If no new message is received, the advertisement manager 56 continues to use the Nth advertisement icon as the message indicator 46 to be displayed. If a
- 25 message is received, the advertisement manager 56 checks if the message is a notification of an N+1 advertisement icon in step 80. If the message is a notification of an N+1 advertisement icon, the variable N is incremented to N+1 and the new N+1 advertisement icon is stored in the advertisement memory 50 to be used as the next message indicator to be displayed. If the
- 30 message is not a notification, the advertisement manager 56 checks to see if the N+1 advertisement icon notification is attached to the received message, step 82. If the message does include an attachment that is the notification of the N+1 advertisement icon, the variable N is incremented to N+1 and the new N+1 advertisement icon is stored in the advertisement memory 50 to be
- 35 used as the next message indicator to be displayed. The attachment may also include a time duration 62, or a category, or an identification ID to further characterize the use of the new advertisement icon. If the message



does not include an attachment of a notification of the N+1 advertisement icon, in step **84**, the advertisement icon N+1 may be assigned by the advertisement manager **56** using a predetermined algorithm or set of rules. If the advertisement manager **56** does not include a predetermined algorithm  
5 for assignment, the process returns to the beginning and the current advertisement icon continues to be displayed as the message indicator **46**. If the advertisement manager **56** includes a predetermined algorithm, the advertisement icon is incremented to N+1 using this algorithm and the process returns to the beginning where the message indicator **46** displayed  
10 is the current advertisement icon.

Advertisement icons as replacements for message indicators facilitate the ability of the end user to navigate through his/her messages when the advertisement icons are assigned based on message topics or categories. The display of the wireless subscriber unit also becomes more visually  
15 stimulating to the end user than a traditional display of message indicator arrows or other geometric shape. The familiarity of the technologically astute end user of today to a display containing advertisement graphics in media such as the internet increases the value of the described invention to the wireless subscriber unit user community.

20 Although the invention has been described in terms of preferred embodiments, it will be obvious to those skilled in the art that various alterations and modifications may be made without departing from the invention. Accordingly, it is intended that all such alterations and modifications be considered as within the spirit and scope of the invention as  
25 defined by the appended claims.

**CLAIMS**

1. A wireless subscriber unit capable of receiving a message from a  
5 wireless communication system, comprising:  
a receiver for receiving the message;  
a message processor coupled to the receiver for processing the  
message;  
a memory coupled to the message processor for storing the  
10 message;  
a display coupled to the message processor for displaying the  
stored message, the displaying including a message indicator;  
an advertisement memory for storing advertisement icons; and  
an advertisement manager coupled to the advertisement  
15 memory and coupled to the display for assigning an advertisement  
icon to the message indicator.
2. A wireless subscriber unit as recited in claim 1, wherein:  
the message includes a message identification number;  
20 the advertisement icon includes an advertisement identification  
number; and  
the advertisement manager assigns the advertisement icon to  
the message indicator by matching the message identification  
number with the advertisement identification number.

3. A wireless subscriber unit capable of receiving a message from a wireless communication system, comprising:
- a receiver for receiving the message, wherein the message includes an advertisement icon;
  - a message processor coupled to the receiver for processing the message;
  - an advertisement manager coupled to the message processor for processing the advertisement icon;
  - an advertisement memory coupled to the advertisement manager, receiving the advertisement icon from the advertisement manager and storing the advertisement icon; and
  - a display coupled to the advertisement manager and coupled to the message processor for displaying a stored message, the display including a message indicator;
- wherein the advertisement manager assigns the advertisement icon to the message indicator.
4. A wireless subscriber unit as recited in claim 3, wherein the message further comprises a message identification number, and wherein the advertisement manager assigns the advertisement icon to the message indicator using the message identification number.
5. A wireless subscriber unit as recited in claim 3, wherein the message further comprises a time duration, and wherein the advertisement manager assigns the advertisement icon to the message indicator using the time duration.

6. In a wireless subscriber unit capable of receiving a message from a wireless communication system, the wireless subscriber unit having a display including a message indicator for visual notification of the received message, a method for customizing the message indicator with an advertisement icon, comprising:
- 5 receiving the message from the wireless communication system;
- processing the message;
- 10 storing the message;
- assigning an advertisement icon to the message; and
- displaying the advertisement icon as the message indicator for the message.
7. In a wireless subscriber unit having a receiver for receiving a message sent from a transmission source and a display including a message indicator for visual notification of the received message, a method for updating the message indicator, comprising:
- 15 displaying a first advertisement icon as the message indicator;
- 20 substituting a second advertisement icon for the first advertisement icon in response to receiving the message; and
- displaying the second advertisement as the message indicator.
8. A method as recited in claim 7, wherein:
- 25 the wireless subscriber unit receives a notification of the second advertisement icon.
9. A method as recited in claim 8, wherein:
- 30 the notification of the second advertisement icon is the message sent from the transmission source.
10. A method as recited in claim 8, wherein:
- the notification of the second advertisement icon is an attachment to the message.

11. In a wireless communication system in which a wireless subscriber unit has a receiver for receiving a message sent from a transmission source and a display including a message indicator for visual notification of the received message, a method for customizing the message indicator, comprising:
- 5 displaying a first advertisement icon as the message indicator; communicating a message from the transmission source to the wireless subscriber unit, and responding thereto by the wireless subscriber unit; and
- 10 substituting a second advertisement icon for the first advertisement icon.
12. A method as recited in claim 11, wherein:
- 15 the transmission source notifies the wireless subscriber unit of the second advertisement icon.
13. A method as recited in claim 12, wherein:
- 20 the second advertisement icon is sent from the transmission source to the wireless subscriber unit as the message.
14. A method as recited in claim 12, wherein:
- 25 the second advertisement icon is sent from the transmission source to the wireless subscriber unit as an attachment to the message.

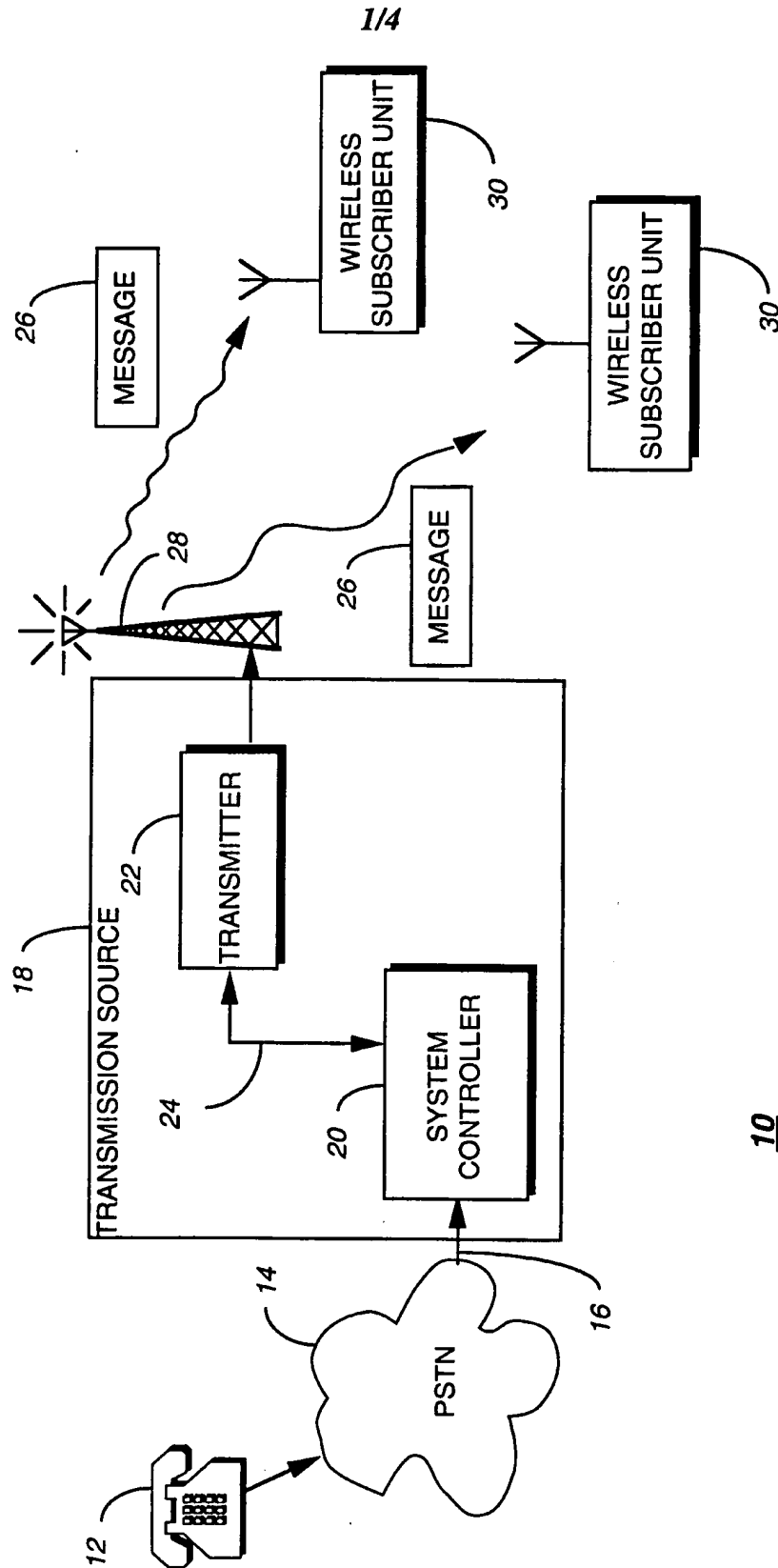


FIG. 1

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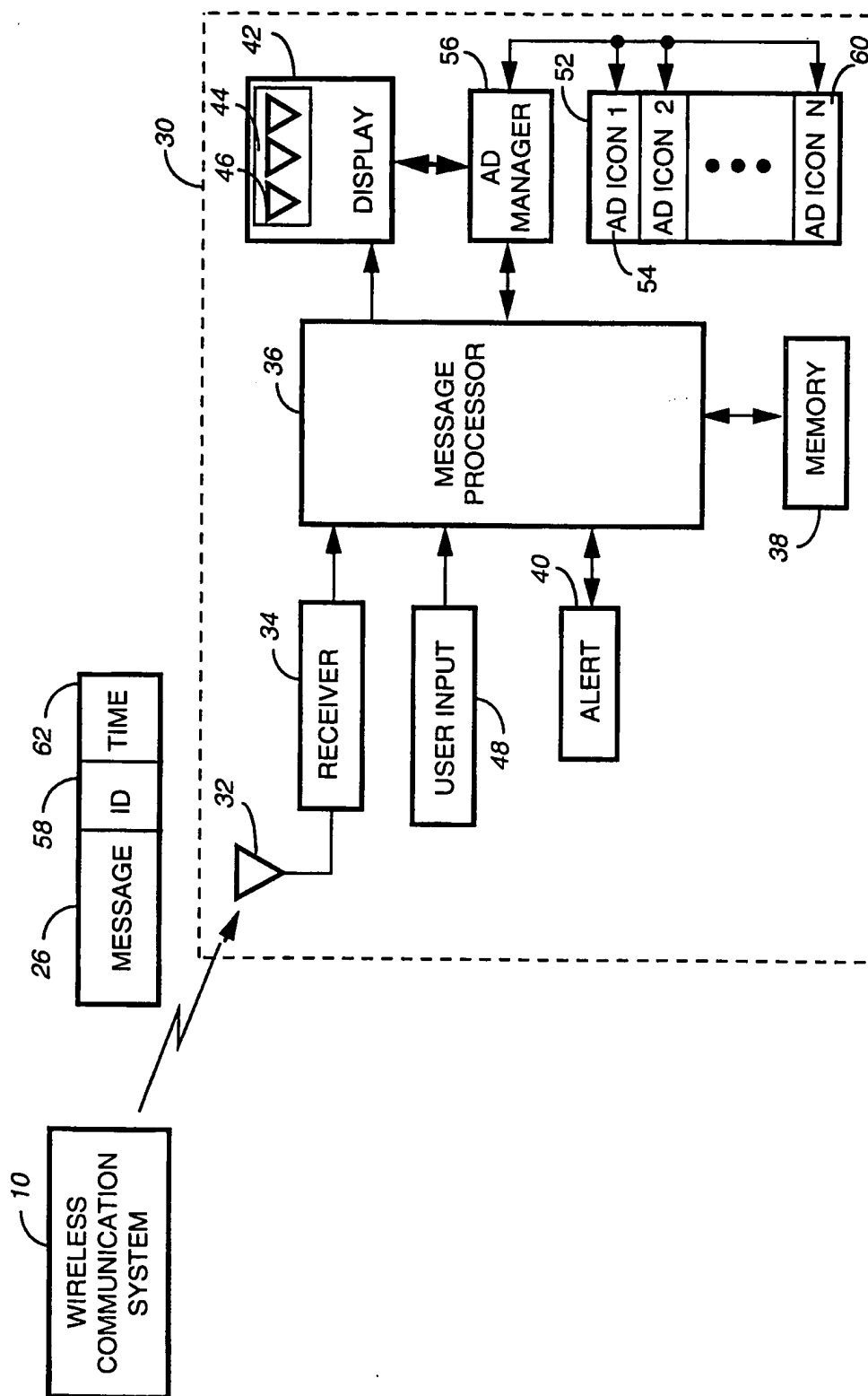
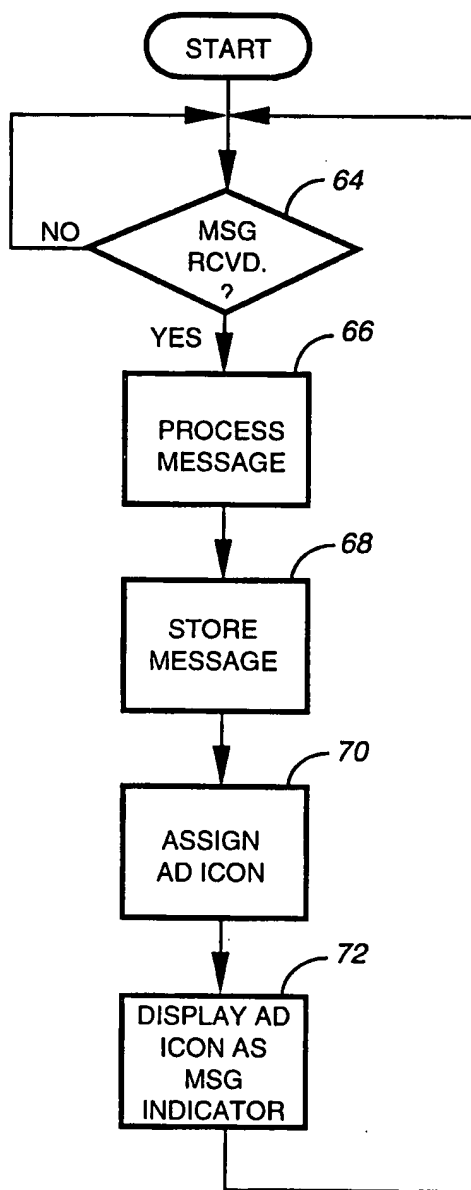


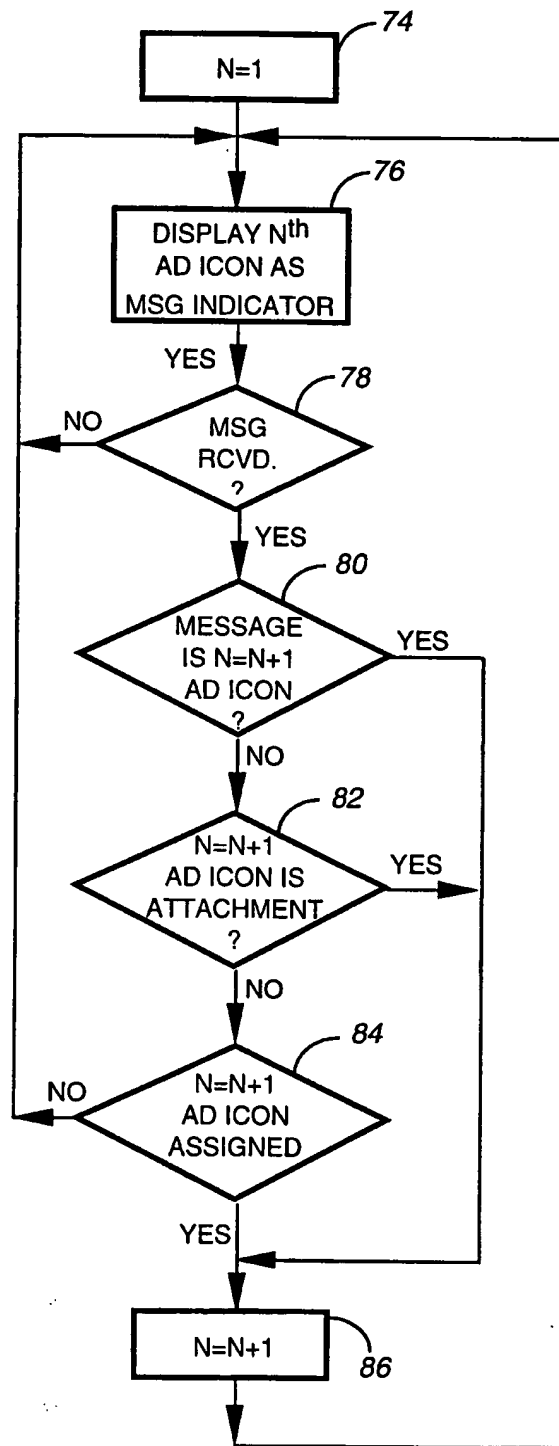
FIG. 2

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**FIG. 3**



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**FIG. 4**

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/22714

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(6) : HO4Q 7/06, 7/07, 7/08, 7/14, 7/20, 7/32, 7/38 US CL : 455/31.1, 31.2, 5.1, 4.1, 4.2, 420, 566, 550 According to International Patent Classification (IPC) or to both national classification and IPC														
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 455/31.1, 31.2, 5.1, 4.1, 4.2, 420, 566, 550  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WEST														
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>														
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.												
X,P	US 5,848,352 A (DOUGHERTY et al.) 08 December 1998, fig. 2A and fig. 2B numbers 234,222,217,226 and 230; col. 10 lines 11-23; col. 5 lines 44-45; col. 19 lines 48-57.	1-14												
X	US 5,671,267 A (AUGUST et al.) 23 September 1997, fig. 1 and col. 3 lines 25-36	1-14												
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.														
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